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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/437,607	11/10/1999	RUFUS L. CHANEY	1797.0090005	8216

4372 7590 03/29/2004

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EXAMINER

IBRAHIM, MEDINA AHMED

ART UNIT PAPER NUMBER

1638

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/437,607

Applicant(s)

CHANEY ET AL

Examiner

Medina A Ibrahim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 5-7, 19-37 and 41-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10-12, 16-18, 38-40 and 48-56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

Applicant's response filed 12/08/03 in reply to the Office action mailed 06/06/03 has been entered. New claims 50-56 are added. Therefore, claims 1-56 are pending. Claims 5-7, 19-37 and 41-47 are withdrawn from consideration.

Claims 1-4, 8-18, 38-40, and 48-56 are under examination.

The declarations, under 37 CFR 1.132, of Yin-MING of 12/08/03 has been considered.

All previous rejections and objections not stated below have been withdrawn.

#### ***Claim Objections***

Claims 50-53 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 8-9, 13-15 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Claim Rejections - 35 USC § 112***

Claims 1-4, 10-12, 16-18, 38-40 and 48-56 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of selectively increasing the amount of at least one metal recovered from metal containing soil by adjusting the pH of the soil from an initial pH to a raised pH of 5.6 to 9.5 and cultivating in the soil the hyperaccumulators of Alyssum, does not reasonably provide

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enablement for the use of any nickel-hyperaccumulator, cobalt-hyperaccumulator, zinc-hyperaccumulator, manganese-hyperaccumulator, and cadmium-hyperaccumulator plant that accumulates the amount of heavy metals from the soil as recited in the claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. This rejection is repeated for the reasons of record as set forth in the Office action of 06/06/03. Applicant's arguments and the declaration of Yin-MING have been considered but are not deemed persuasive.

Applicant's arguments and the declaration state that a variety of hyperaccumulators including Brassicaceae and non-Brassicaceae plants are suitable for use in the claimed method. The declarant states that pH levels of from 5.6 to 9.5 are expected to increase metal accumulation in all hyperaccumulators, and that Applicants were first to report increased shoot metal accumulation in natural hyperaccumulators with increased soil pH (paragraph 2 of the declaration). On paragraph 3, the declarant however, states that the Zn and Cd hyperaccumulators *Thlaspi caerulescens* of the prior art have decreased metal uptake at pH levels within the range described in the present invention. Applicant cites Brown et al reference (J. Environ. Qual 23, pp. 1151-1157 (1994)). A copy of Brown et al reference was not provided.

Applicant's arguments are not persuasive because the scope of the claims is not commensurate with the enabling disclosure, and paragraph 3 of the declaration provides further evidence that the claimed method is not for all hyperaccumulators of Ni, Co, Cd, Mg and Zn. Applicant has provided no evidence to support the broad scope of

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the claims. There are approximately more than 400 plant taxa known to hyperaccumulate at least one metal. Applicant's unexpected results are limited to the use of two species of the Brassicaceae family and one species of the non-Brassicaceae. Of the two Brassicaceae species, a decreased metal uptake at pH levels within the range described in the present invention was reported in *Thlaspi caerulescens*. The prior art reference of Brown et al (J. Environ. Qual 23, pp. 1151-1157 (1994) suggests that not even all *T. caerulescens* plants can accumulate the Cd and/or Zn levels as recited in the claims. Salt et al (Biotechnology, vol. 13, pp. 468-474, 1995(Applicant's IDS)) strongly suggest that the ability of a plant to accumulate heavy metals is a genotype dependent and varies greatly between species and between cultivars within the species. Pollard et al (New Phytol. (1996), vol. 132, pp. 113-118(Applicant's IDS). Neither the instant specification nor the prior art provides guidance for how to identify the desired hyperaccumulator genotypes. One skilled in the art would have to test an infinite number of Ni, Co, Cd, Mg and Zn -hyperaccumulator plants in order to identify and obtain a representative number of genotypes having the desired metal accumulating ability. Such a test is considered excessive and undue. Therefore, for the reasons discussed above and in the last Office action of 6/06/03, the claimed invention is not enabled throughout the broad scope. The rejection is maintained.

### **Remarks**

Claims are deemed free of the prior art in view of the declarations under Rule 1.132 of Yin-MING.

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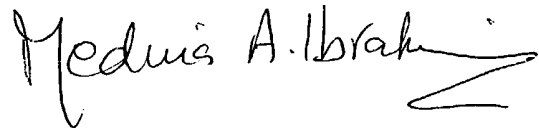
No claim is allowed.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Medina A. Ibrahim whose telephone number is (571) 272-0797. The Examiner can normally be reached Monday -Thursday from 8:00AM to 5:30PM and every other Friday from 9:00AM to 5:00 PM . Before and After final responses should be directed to fax nos. (703) 872-9306 and (703) 872-9307, respectively.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Amy Nelson, can be reached at (571) 272-0804.

Mai  
3/18/04

A handwritten signature in black ink, appearing to read "Medina A. Ibrahim", with a stylized flourish at the end.